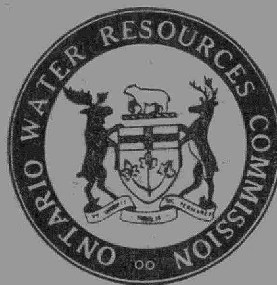


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Ind. Wastes  
Survey*



THE  
ONTARIO WATER RESOURCES  
COMMISSION  
  
INDUSTRIAL WASTES SURVEY  
  
of the  
  
TOWN OF LINDSAY

1968



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CADON  
WR550  
1968  
R234

A REPORT  
on  
AN INDUSTRIAL WASTES SURVEY  
of  
THE TOWN OF LINDSAY

1968

Division of Industrial Wastes  
ONTARIO WATER RESOURCES COMMISSION

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AN INDUSTRIAL WASTES SURVEY OF THE TOWN OF LINDSAY

1968

INTRODUCTION

A survey of the industries in the Town of Lindsay was conducted during January and March, 1968.

Information is presented on the industries that use more than 1,000 gallons of water per day. A minimum amount of information is included on the industries that discharge their wastes to the municipal sanitary system.

Watercourses in Lindsay are Sinister Creek and the Scugog River with Sinister Creek discharging into the Scugog River.

SUMMARY

A summary of the information obtained in this survey is presented in the following table.

Industry	Process	Water Consumption (gpd)	Waste Discharge to	Remarks
Abex Industries of Canada Limited	production of friction materials (brake linings)	73,500	cooling - to Sinister Creek	satisfactory
Brinton Carpets Limited	manufacture of carpets	22,100	latex and dye wastes to sanitary system	"
Canada Crayon Company Limited	manufacture of crayons and chalk	5,700	sanitary system	"
Firestone Industrial Products	rubber products and car hose	122,000	all wastes except domestic to storm	unsatisfactory
Gentil Plastics Limited	plastic extrusion	109,000	cooling to the Scugog River	satisfactory
Marlyn Superior Products Limited	production of laminated board	14,700	cooling to sanitary	"
Reichhold Chemicals Canada Limited	production of ground varcum (bakelite)	64,200	cooling to Sinister Creek	"
Rosedale Plastics (Containers) Limited	plastic extrusion	4,000	cooling to the Scugog River	"
Schultz Die Casting Company of Canada Limited	die casting	113,200	cooling to Sinister Creek	satisfactory - possible future re-circulation
J. E. Thomas Specialties Limited	plastic extrusion forming, plating and alodizing	30,000	all wastes to sanitary system	satisfactory

continued.

Industry	Process	Water Consumption (gpd)	Waste Discharge to	Remarks
Turner and Seymour of Canada Limited	machining and chain plating	3,500	process wastes to Sinister Creek	satisfactory
Union Carbide Canada Limited	cellulose casing	470,000	process - treated to Sinister Creek cooling - directly to Sinister Creek	unsatisfactory
Uniroyal (1966) Limited	nylon mesh and high pile fabric	48,500	process wastes to sanitary system - cooling water to storm	satisfactory

An intensive follow-up programme is planned for the "unsatisfactory" industries, while routine surveillance will be carried out at the acceptable industries.

ABEX INDUSTRIES OF CANADA LIMITED  
AMERICAN BRAKEBLOC DIVISION.

This industry located at 50 Colborne Street East was inspected on January 23, 1968.

DETAILS OF SURVEY

Personnel Interviewed	- Mr. M. Endicott, Plant Superintendent
Operating Schedule	- 8 hours per day - 5 days per week
Employees	- 71 (total)
Raw materials	- resins, solvents, asbestos
Products	- friction materials and asbestos brake linings.

Description of Plant and Process

Various materials are mixed to form the lining material which is shaped in a press, treated, and finished as required. The linings are then bonded to brake shoes and the shoes are painted.

Water Consumption and Distribution

PUC (1967) - maximum 91,000 gallons per day  
minimum 50,400 gallons per day  
average 73,500 gallons per day

Distribution within plant -

domestic 1,400 gallons per day  
process 72,100 gallons per day  
total 73,500 gallons per day

### Sources of Liquid Wastes and Disposal

The main sources of wastes are:

- domestic
- cooling water
- rotoclone scrubber water

Domestic wastes are discharged to the municipal sanitary sewerage system.

All cooling water is discharged untreated to Sinister Creek.

The rotoclone scrubber water is recirculated in a completely closed system. The waste flow from the rotoclones goes through a quiescent stage where the solids settle out and the supernatant is decanted off and recycled. The sludge is hauled for disposal on the land.

### Sampling and Analysis

A grab sample of the plant effluent to Sinister Creek was obtained on January 23, 1968, and submitted to the OWRC laboratory for analysis in accordance with procedures outlined in "Standard Methods for the Examination of Water and Wastewater", 12th edition.

### CONCLUSIONS

The quality of the waste discharging from this plant to Sinister Creek on January 23, 1968, complied with the OWRC objectives.

ABEX INDUSTRIES OF CANADA LIMITED -  
LINDSAY

Date Sampled: January 23, 1968

Lab. No.	5-Day B.O.D.	Solids			pH at Lab.	Ether Solubles
		Total	Susp.	Diss.		
T-114	4.8	364	7	357	7.4	tr.
T-114      1. Discharge to Sinister Creek - Grab at 4:00 p.m.						

All analyses except pH reported  
in ppm unless otherwise indicated

BRINTON CARPETS LIMITED

This plant located on Needham Street was inspected on  
January 25, 1968.

DETAILS OF SURVEY

Personnel Interviewed - Mr. A. W. Roelofsen, Plant  
Manager

Operating Schedule - 8 hours per day  
- 5 days per week

Employees - 46 (total)

Products - various types of carpets.

Description of Process

This mill spins various types of fibres into yarns suitable for carpeting. These yarns are then woven on a backing to form the carpet. Latex is used as an adhesive to put an additional backing on the carpets. The woven carpets are dyed in one of two large dyeing vats.

Water Consumption (1967)

maximum	-	1,034,000	gallons	per	month
minimum	-	173,000	"	"	"
average	-	487,000	"	"	"

Sources of Liquid Wastes and Disposal

The main sources of liquid wastes are:

- domestic wastes
- latex (spillage and wash-up)
- dye kettle discharge
- cooling water

The latex wastes are directed to a sump where the solids are skimmed off and the remainder discharged to the sanitary sewer. Dye kettle wastes enter a sump where lint is removed by a scrapper mechanism and then discharged to the sanitary sewer. All other wastes discharge directly to the sanitary sewer.

#### Sampling and Analysis

Samples were not obtained of the various wastes discharged from this plant into the municipal sewerage system.

#### DISCUSSION OF FINDINGS

Conscientious surveillance of waste disposal equipment should minimize the amounts of fibre and latex entering the municipal sewerage system.

The dye entering the sanitary sewers does not appear to be adversely affecting the efficiency of treatment in the lagoon system.

CANADA CRAYON COMPANY LIMITED.

This plant is located at 15 Mary Street West. It was inspected on January 23, 1968.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. W. Shuttleworth, Administrative Manager
Operating Schedule	-	8 hours per day 5 days per week
Employees	-	71 (total)
Products	-	crayons
Raw Materials	-	wax, dye, whiting, plaster

Description of Plant and Process

The liquid ingredients (wax, additives, etc.) for crayons are poured into molds and solidified into the shape of crayons. The crayons then receive a paper cover and are boxed for shipment. Mixing kettles are washed with hot wax which is used in the darker colour formulations.

Chalk paste, consisting of plaster and additives is extruded and baked. All paste wastes are collected and disposed of at the local dump.

Water Consumption

PUC	-	16,000	gallons per month
Well	-	110,000	" " "
Total	-	126,000	" " "

Sources of Liquid Wastes and Disposal

<u>Source</u>	<u>Point of Disposal</u>
crayon kettle washing	- included in process
boiler blowdown	- sanitary system
water softener regeneration	- sanitary system
extruder coolant	- recycled with temperature control and some is bled to the sanitary system
chalk paste wastage	- land dumped
roof drains	- lawn watering
domestic	- sanitary system

Sampling and Analysis

No samples were obtained.

DISCUSSION OF FINDINGS

Industrial wastes discharged from this plant should not have any adverse effects on the municipal lagoon system.

FIRESTONE INDUSTRIAL PRODUCTS

This plant located at 100 Albert Street in Lindsay was inspected on January 26 and March 5, 1968.

SUMMARY

The effluent from this plant to the Lindsay storm sewer system does not comply with OWRC objectives for storm sewer discharge.

It is recommended that the company conduct a complete investigation of the wastewater treatment and disposal problem.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. H. Lopes, Plant Manager
	-	Mr. D. Adams, Maintenance Supervisor
	-	Mr. R. Baptiste, Plant Engineer
Operating Schedule	-	24 hours per day
	-	5 days per week
Employees	-	180 (total)

Description of Plant and Process

Various raw materials such as rubber, carbon black, dye, oil, etc., are ground and mixed in a bambury in batch lots. Each batch is then put through a rubber mill, dipped in a tank filled with a glycol base solution (festoon), cooled and dried in an air tunnel. Some types of rubber are also coated with clay to prevent sticking. "Finished batches" go directly for processing while others, called "master batches", are stored for re-processing into "finished batches".

The rubber is put through a series of mills and then through either a tube or solid extruder. Solid extruder products are used to feed the various injection and pressure molding machines. The tube has a nylon mesh sleeve knitted over it and is then put through another extruder which coats the mesh with rubber.

The completed hose is cut to length, formed on mandrels and placed in steam curing ovens. Cured hoses are washed, trimmed as required and packaged for shipment.

Steel inserts used in specialty items are degreased, buffed in a grit blast and coated with cement. Molded specialty items are finished in a dry ice cooled tumbling machine.

#### Water Consumption

PUC (1967)	-	minimum	-	90,000	gallons	per	day
		maximum	-	156,000	"	"	"
		average	-	122,000	"	"	"

#### Sources of Liquid Wastes and Disposal

The main sources of liquid wastes are:

1. seepage into bambury sump.
2. lubricant spillage in festoon area.
3. coolant recirculation tank overflow.
4. lubricant spillage and floor wash from the outside tube extruder area.
5. spillage of lubricant and wash in mandrel area.
6. condensate from curing ovens.

7. cured hose wash.
8. leakage from watercooled bandsaws.
9. overflow from hydraulic recirculating system.
10. air compressor coolant.
11. boiler blowdown and softener backwash.
12. degreaser coolant.
13. equipment washing in cement house.
14. roof drains.
15. general floor washing.
16. domestic.

Domestic wastes are directed to the municipal sanitary sewerage system. Boiler blowdown, softener backwash and degreaser coolant are directed to a ditch behind the plant where they seep into the ground. All other wastes are directed to the municipal storm sewer system.

Distribution of Water in the Plant

recirculation tank overflow:

summer	-	80,000	gallons per day
winter	-	20,000	" " "
mandrel area and extruder floor washing	-	25,000	" " "
condensate	-	360	" " "
cured hose wash	-	500	" " "
air compressor coolant, boiler blowdown and softener backwash	-	41,800	" " "
<hr/>			
	-	117,660	gallons per day

brought forward	-	117,660	gallons per day
degreaser coolant	-	100	" " "
domestic	-	3,600	" " "
total	-	121,360	gallons per day

other (by diff.) 640 gallons per day

note: all flow volumes are estimated.

#### Sampling and Analysis

Samples of the total plant effluent to the storm sewer as well as several inplant samples were obtained. All samples were submitted to the OWRC laboratory for analysis in accordance with procedures outlined in "Standard Methods for the Examination of Water and Wastewater", 12th edition.

#### WASTE LOADINGS

Characteristics of the waste flow from this plant to the storm sewer are summarized in the following table:

Sample	Suspended Solids (ppm)	BOD <sub>5</sub>	ABS	ether solubles (ppm)	pH (ppm)
T-119	15	8.0	3.3	58	7.8
T-433	87	36	7.1	58	7.6
T-434	33	42	2.5	97	9.0
average	46	29	4.3	71	7.6 - 9.0
OWRC objective	15	15	-	15	5.5 - 9.5

T-119 - grab at 3:00 p.m. - January 26, 1968.

T-433 - composite - 2:30 p.m. - 2:45 p.m. - 3:00 p.m.  
- March 5, 1968.

T-434 - grab at 3:45 p.m. - March 5, 1968.

The following table summarizes the waste loadings from this plant based on average sample results and a flow of 122,000 gallons per day.

<u>Contaminant</u>	<u>Loading (lb/day)</u>
BOD <sub>5</sub>	35.4
Suspended Solids	56.1
Ether solubles	86.5

In-plant samples were not adequate to calculate a loading from the individual waste sources.

#### DISCUSSION OF FINDINGS

The effluent from this plant to the Lindsay storm sewer system exceeded OWRC objectives in terms of BOD<sub>5</sub>, suspended solids, and ether solubles concentrations.

The major portion of this waste loading originates in the mandrel and outside tube extrusion areas, with a smaller amount contributed by the curing oven condensate, the overflow from the hydraulic recirculating system, the laboratory waste, and general floor washings. Periodic dumps such as the barrel washer after the curing oven, (T-430), cement house washings, and bambury sump discharges are also definitely unacceptable for discharge to a storm sewer.

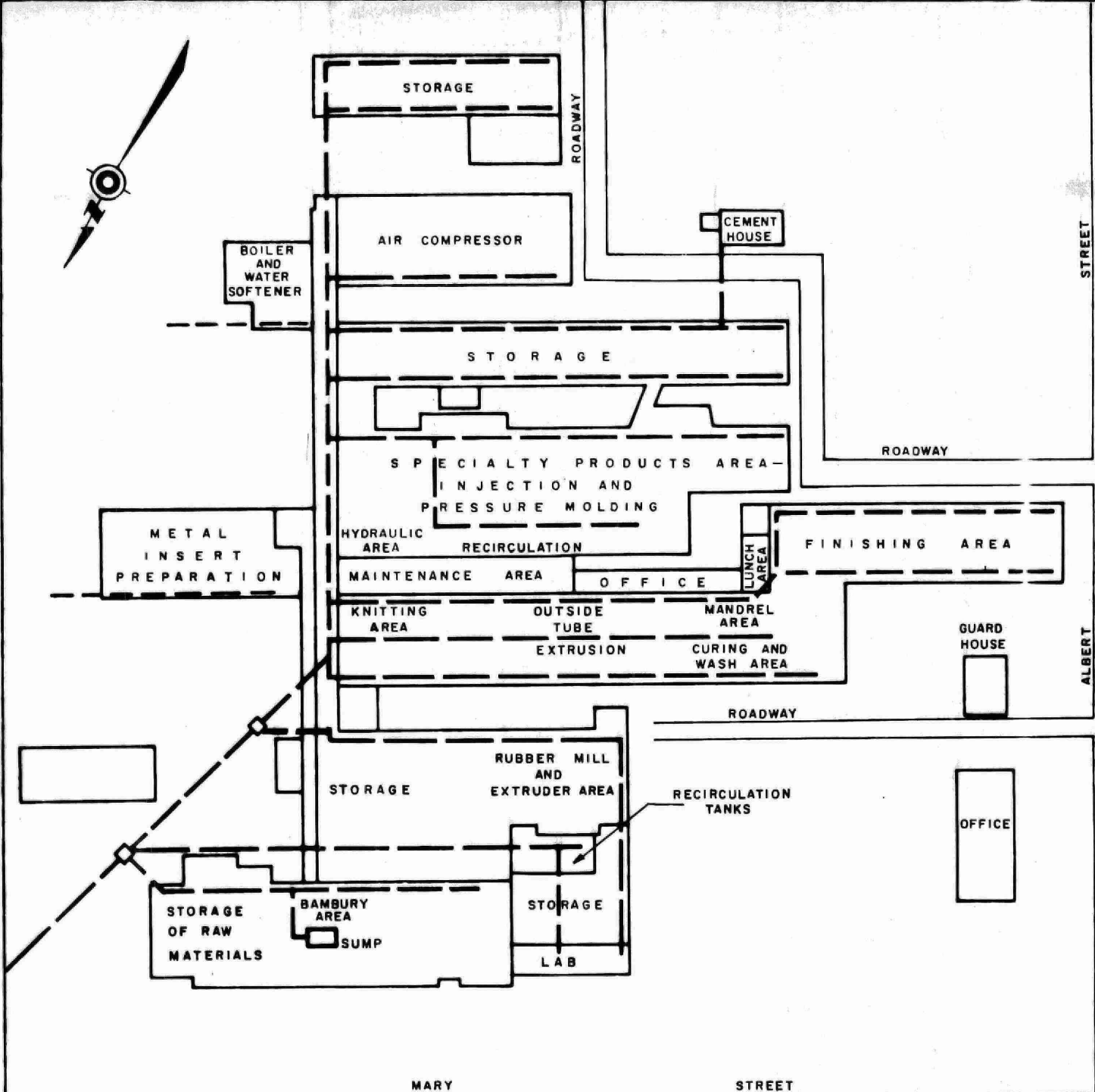
In view of the number of sources of contaminated waste, the lack of sewer segregation and the number of rainwater downspouts in the system, it is recommended that the company conduct a complete investigation of the waste disposal problem. This study should include

a reasonable estimate of waste volumes from the various operations and contaminant concentrations in the flows.

CONCLUSION.

The effluent from this plant to the Lindsay storm sewer system does not comply with OWRC objectives for storm sewer discharge.

In view of the number of contaminated flows and the lack of sewer segregation, it is recommended that the company conduct a complete investigation of the wastewater treatment and disposal problem.



# LEGEND

--- - STORM SEWER

ONTARIO WATER RESOURCES COMMISSION

## FIRESTONE INDUSTRIAL PRODUCTS LINDSAY STORM SEWER SCHEMATIC

SCALE: NOT TO SCALE

DRAWN BY: L.L. BROOME

DATE: MARCH, 1968

CHECKED BY: I.F.

DRAWING No: 68-IR-21

# FIRESTONE INDUSTRIAL PRODUCTS

Date Sampled: March 5, 1968

All analyses except pH reported in  
ppm unless otherwise indicated

Lab. No.	5-Day B.O.D.		Solids		COD	Anionic Detergents as ABS	Ether Solubles	pH at Lab.
		Total	Susp.	Diss.				
T-429	1.3	366	4	362	22.	0	trace	8.3
T-430	35.	2028	106	1922	293.	5.8	39	11.6
T-431	65.	*	34	*	4687	8.5	337	7.3
T-432	112.	570	125	445	1757	3.4	140	6.8
T-433	36.	874	87	787	1045	7.1	58	7.6
T-434	42.	1056	33	1023	2064	2.5	97	9.0
* Would not dry, test could not be performed								
T-429	1.	Overflow from recir. system			Grab at 2:20 P.M.			
T-430	2.	Hydraulic oil overflow			Grab at 2:30 P.M.			
T-431	3.	Wash after cure			Grab at 2:30 P.M.			
T-432	4.	Extruder wash			Grab at 3:20 P.M.			
T-433	5.	Storm sewer discharge			Comp. 2:30 P.M. - 3:00 P.M.			
T-434	6.	Storm sewer discharge			Grab at 3:45 P.M.			

# FIRESTONE INDUSTRIAL PRODUCTS

Date Sampled: January 26, 1968

All analyses except pH reported in  
p.p.m. unless otherwise indicated

Lab. No.	5-Day B.O.D.	Solids			COD	pH at Lab.	Anionic Deter- gents as ABS	Ether Solubles
		Total	Susp.	Diss.				
T-119	8.0	752	17	735	760	7.8	3.3	58
T-119      1.      Effluent to storm      Grab at 3:00 p.m.								

GENTIL PLASTICS LIMITED

This plant is located at 65 King Street, and it was inspected on January 25, 1968.

DETAILS OF SURVEY

Personnel Interviewed - Mr. L. Gentile, Production Manager.

Operating Schedule - 24 hours per day.  
- 5 days per week.

Number of Employees - 25

Products - plastic housewares (such as plastic pails, etc.)

Raw Materials - various types of plastics

Description of Process

Plastic beads are extruded into various forms such as plastic pails, baskets and other household articles.

Water Consumption (1967)

	PUC	Scugog <sup>(1)</sup> River	Total
gallons per month (max.)	56,800	2,376,000	2,432,800
gallons per month (min.)	6,200	2,396,000	2,382,200
gallons per month (avg.)	21,500	2,396,00	2,347,500

(1) estimated

Sources of Liquid Wastes and Disposal

Domestic	-	11,000 gallons per month
Cooling	-	2,386,500 gallons per month (by difference)
TOTAL	-	<u>2,397,500 gallons per month</u>

Domestic sewage is discharged to the municipal sanitary system. Cooling water is discharged untreated to the Scugog River.

#### Sampling and Analysis

A grab sample of the plant effluent to the Scugog River was obtained on January 25, 1968, at 2:30 p.m. The sample was submitted to the OWRC laboratory for analysis of solids, BOD<sub>5</sub>, pH, COD and ether solubles in accordance with procedures outlined in "Standard Methods for the Examination of Water and Wastewater", 12th edition.

Analytical results are appended.

#### DISCUSSION OF FINDINGS

On January 25, 1968, the waste discharged from this plant to the Scugog River complied with OWRC objectives for discharge to a watercourse in terms of suspended solids, BOD<sub>5</sub> and ether soluble concentration and pH level.

GENTIL PLASTICS LIMITED

Date Sampled: January 25, 1968

All analyses except pH reported in  
p.p.m. unless otherwise indicated

Lab. No.	5-Day B.O.D.	Solids			pH at Lab.	C.O.D.	Ether Solubles
		Total	Susp.	Diss.			
T-117	3.0	362	8	354	7.6	33	tr.
<p>T-117      1.      Effluent to Scugog River - grab 2:30 p.m.</p>							

MARLYN SUPERIOR PRODUCTS LIMITED.

This industry, located at 79 Durham Street West in Lindsay was inspected on March 5, 1968.

DETAILS OF SURVEY

Personnel Interviewed - Mr. O. Honsa, Assistant  
General Manager.

Operating Schedule - 9 hours per day.  
- 5 days per week.

Number of Employees - 25.

Description of Plant and Process

This plant manufactures a plastic arborite like coating on chipboard in a hot pressing operation. The board is subsequently formed into desk tops, etc.

Water Consumption and Distribution

Consumption (PUC, 1967)

- Average 14,700 gallons per day

Distribution

- Domestic 500 " " "

- Process 14,200 (by difference)

TOTAL 14,700 gallons per day

Sources of Liquid Wastes and Disposal

The process wastes consist of boiler blowdown and press coolant. Process wastes as well as domestic wastes are discharged to the municipal sanitary sewer system.

Sampling and Analysis

Samples were not obtained from the various process streams in this plant.

CONCLUSIONS

Wastes discharged from this plant should not adversely affect the municipal sewerage system.

REICHHOLD CHEMICALS CANADA LIMITED -  
VARCUM DIVISION.

This plant, located on St. David Street in Lindsay, was inspected on January 22, 1968.

DETAILS OF SURVEY

Personnel Interviewed - Mr. J. Purdy, Plant Manager.

Operating Schedule - 24 hours per day (9 months per year).  
- 16 " " " (3 " " " ).  
- 5 days per week.

Number of Employees - 24.

Products - Varcum (similar to ground bakelite).

Raw Materials - Resins, wood filler, dyes.

Description of Plant and Process.

Resins, wood filler, dye, water and various other additives are combined and mixed in a ball mill. The dough-like mixture from the ball mill is extruded in a series of heated presses and then cooled in an air stream on a cooling belt. The cooled brittle material is ground and sold under the tradename "Varcum" as a powder for final processing into articles such as distributor caps, toaster handles, etc.

Water Consumption (1967)

Maximum - 1,993,700 gallons per month

Minimum - 1,069,600 " " "

Average - 1,412,100 " " "

Sources of Liquid Wastes and Disposal

Sanitary	-	10,600	gallons per month
Process (combined in product)	-	4,000	" " "
Cooling and boiler	-	<u>1,397,500</u>	" " "
TOTAL	-	<u>1,412,100</u>	gallons per month

Cooling water and boiler blowdown are discharged untreated to Sinister Creek. Domestic wastes are discharged to the municipal sanitary sewerage system.

Sampling and Analysis

A grab sample of the cooling water discharged to Sinister Creek was obtained on January 23, 1968, at 3:00 p.m. The sample was submitted to the OWRC laboratory for analysis of solids, BOD<sub>5</sub>, COD, pH, and ether solubles in accordance with procedures outlined in "Standard Methods for the Examination of Water and Wastewater", 12th edition.

Analytical results are appended.

DISCUSSION OF FINDINGS.

On January 23, 1968, the quality of the waste discharged from this plant to Sinister Creek complied with OWRC objectives for discharge to a watercourse. No industrial wastes are discharged from this plant to the municipal sewerage system.

REICHHOLD CHEMICALS CANADA LIMITED -  
VARCUM DIVISION.

Date Samples: January 23, 1968

All analyses except pH reported in  
p.p.m. unless otherwise indicated

Lab. No.	5-Day B.O.D.	Solids			C.O.D.	pH at Lab.	Ether Solubles
		Total	Susp.	Diss.			
T-113	1.4	414	9	405	22	7.3	tr.
T-113      1.      Effluent to Sinister Creek - Grab at 3:00							

ROSEDALE PLASTICS (CONTAINERS) LIMITED.

This plant, located on Logie Street in Lindsay, was inspected on January 25, 1968.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. W. H. Harris, Plant Manager.
Operating Schedule	-	16 hours per day.
	-	5 days per week.
Number of Employees	-	43.
Products	-	plastic containers.
Raw Materials	-	plastic beads.

Description of Plant and Process

This plant molds plastic containers such as garbage cans from ground plastic spheres. Various dyes are added to colour the product as required.

Water Consumption (1967)

Maximum	-	107,300 gallons per month
Minimum	-	57,500 " " "
Average	-	88,000 " " "

Sources of Liquid Wastes and Disposal

Sanitary	-	18,900 gallons per month
Process	-	69,100 " " "
TOTAL	-	<u>88,000 gallons per month</u>

Sanitary wastes are discharged to a septic tank and tile field system. Process wastes consisting of grinder and molder coolant are discharged directly to the Scugog River.

#### Sampling and Analysis

A sample of the plant effluent to the Scugog River was not obtained because of the ice and snow conditions prevailing during the visit.

#### CONCLUSIONS AND RECOMMENDATIONS

The process wastes from this plant consist entirely of cooling water which does not contact the product and its quality should therefore be acceptable for continued discharge to a water-course.

It is recommended that a sample of the plant effluent to the Scugog River be obtained when weather conditions permit in order to verify this assumption.

SCHULTZ DIE CASTING COMPANY OF CANADA LIMITED.

Schultz Die Casting Company of Canada Limited, located at 67 St. David Street in Lindsay, was inspected on January 23, 1968.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. A. Ford, Production Manager.
	-	Mr. D. Loly, General Manager.
	-	Mr. W. DuBuque, General Foreman.
Operating Schedule	-	16 hours per day.
	-	5 days per week.
Number of Employees	-	200.
Products	-	approximately 3,000 different types of zinc castings.

Description of Plant and Process.

Zinc blocks are melted, cast, cooled in water, trimmed in various presses and drilled or machined as required.

This plant does not do any plating or tumbling.

Water Consumption

PUC (1967)

Maximum	-	151,000 gallons per day.
Minimum	-	77,900 " " "
Average	-	115,200 " " "

Sources of Liquid Wastes and Disposal

Domestic	-	4,000 gallons per day.
Process	-	111,000 " " "

The main use of process water is for cooling castings as they are removed from the casting machines.

Domestic wastes are directed to the municipal sewerage system and process wastes discharge untreated to Sinister Creek.

Sampling and Analysis

A grab sample of the process waste discharged to Sinister Creek was obtained on January 23, 1968. This sample was submitted to the OWRC laboratory for analysis in accordance with procedures outlined in "Standard Methods for the Examination of Water and Wastewater", 12th edition.

CONCLUSIONS AND RECOMMENDATIONS

On January 23, 1968, the quality of the wastes discharged from this plant to Sinister Creek complied with OWRC objectives for discharge to a watercourse.

Mr. W. DuBuque indicated that the process cooling water would be recirculated in a closed system by the summer of 1968.

Date Sampled: January 23, 1968.

Lab. No.	5-Day B.O.D.	Solids			pH at Lab.	Ether Solubles	Anionic Detergents as ABS	C.O.D.
		Total	Susp.	Diss.				
T-115	6.8	318	6	312	7.7	2	0.5	33

T-115      1.      Storm sewer discharge to Sinister Creek - grab  
at 2:00 p.m.

J. E. THOMAS SPECIALTIES LIMITED.

This industry, located at 50 Mary Street West in Lindsay, was inspected on January 23, 1968. This industry was previously known as Lindsay Antenna.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. H. W. Price, Plant Manager.
	-	Mr. P. Tavaszi, Plant Engineer.
Operating Schedule	-	8 hours per day.
	-	5 days per week.
Number of Employees	-	120.
Products	-	aluminum tubing.
	-	aluminum chairs.
	-	antennas
Raw Materials	-	aluminum sheet
	-	plastic

Description of Plant and Process

This plant manufactures aluminum tubing in a tube rolling mill and small plastic articles such as chair arms by plastic extrusion molding. Some aluminum articles such as antenna rods are anodized as outlined in the following diagram.

Some articles are zinc plated in a low cyanide plating system.

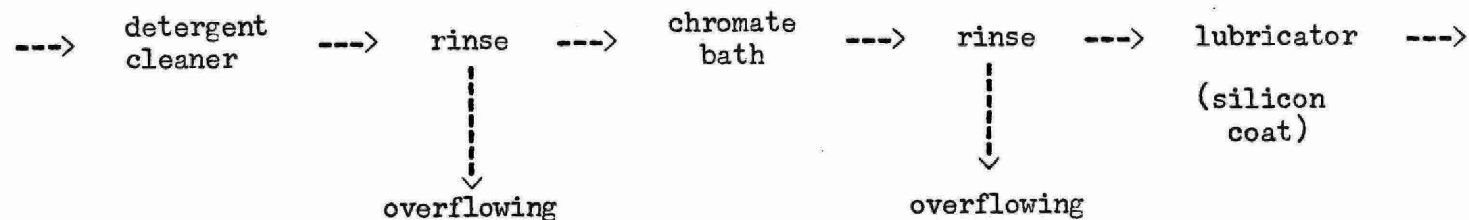
Water Consumption (1967)

Minimum	-	343,824	gallons	per	month
Maximum	-	1,301,040	"	"	"
Average	-	657,072	"	"	"

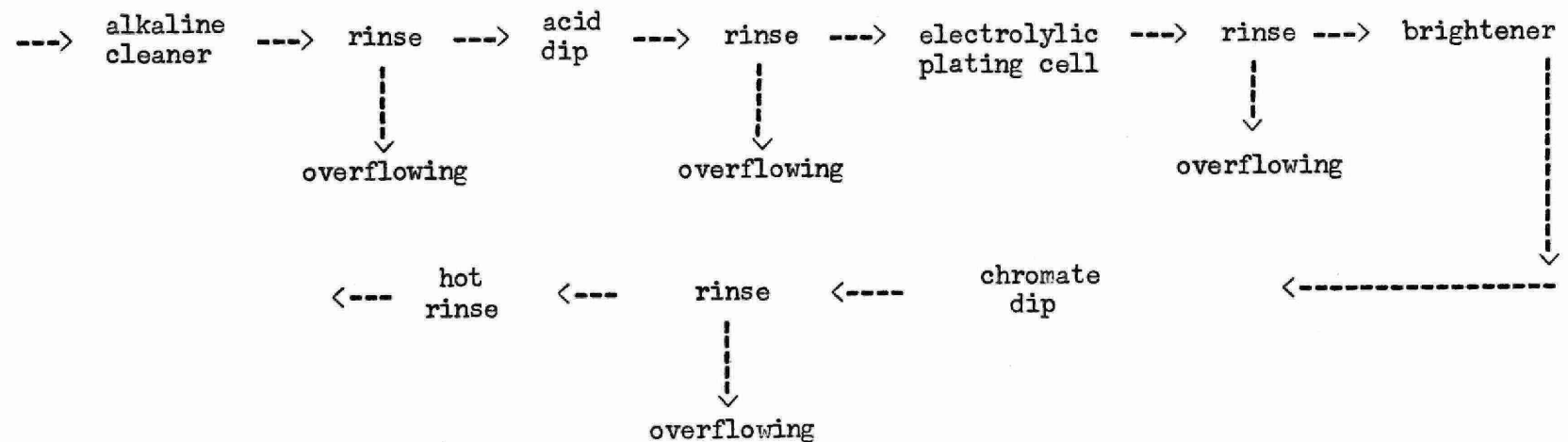
J. E. THOMAS SPECIALTIES LIMITED

PROCESS SCHEMATIC

Anodizing



Zinc Plating



### Sources of Liquid Wastes and Disposal

The main sources of liquid wastes are:

vapour degreaser coolant and compressor coolant	- 65,700	gallons per month		
tube rolling mill (cooling electronic welding equip- ment)	- 394,300	"	"	"
plastic injection molding (cooling dyes)	- 78,500	"	"	"
plating (a) zinc	- 52,600	"	"	"
(b) anodizing	- 13,200	"	"	"
domestic waste	- <u>52,800</u>	"	"	"
TOTAL	- <u>657,100</u>	gallons per month		

### Disposal

All wastes enter a common sump and discharge to the municipal sanitary sewer untreated.

### Sampling and Analysis

A grab sample was obtained from the first overflowing rinse following the zinc plating bath. This sample was analysed for BOD<sub>5</sub>, solids, pH, cyanide and zinc, at the OWRC laboratory in accordance with procedures outlined in "Standard Methods for the Examination of Water and Wastewater", 12th edition.

### DISCUSSION OF FINDINGS

Sample T-116 of the first overflowing rinse following the zinc plating tank had a cyanide content of 2.7 ppm. However, considering the amount of dilution with other wastes before discharge

to the municipal sewerage system, it is unlikely that this waste will affect the sewerage system in a deleterious manner.

J. E. THOMAS SPECIALTIES

Date Sampled: January 24, 1968

All analyses except pH reported in  
p.p.m. unless otherwise indicated

Lab. No.	5-Day B.O.D.	Solids			pH at Lab.	Cyanide as HCN	Zinc as Zn.
		Total	Susp.	Diss.			
T-116	4.4	600	195	405	9.8	2.7	0.3
T-116      1.      First rinse after zinc plate - Grab at 4:30 p.m.							

TURNER AND SEYMOUR OF CANADA LIMITED

This plant, located at 78 St. David Street in Lindsay, was inspected on January 25 and 26, 1968.

DETAILS OF SURVEY

Personnel Interviewed	-	Mr. G. Graham, Plant Manager.
	-	Mr. W. Humphries, Plant Superintendent.
Operating Schedule	-	8 hours per day.
	-	5 days per week.
Number of Employees	-	21.
Raw Materials	-	steel wire.
Products	-	plated chain.

Description of Plant and Process

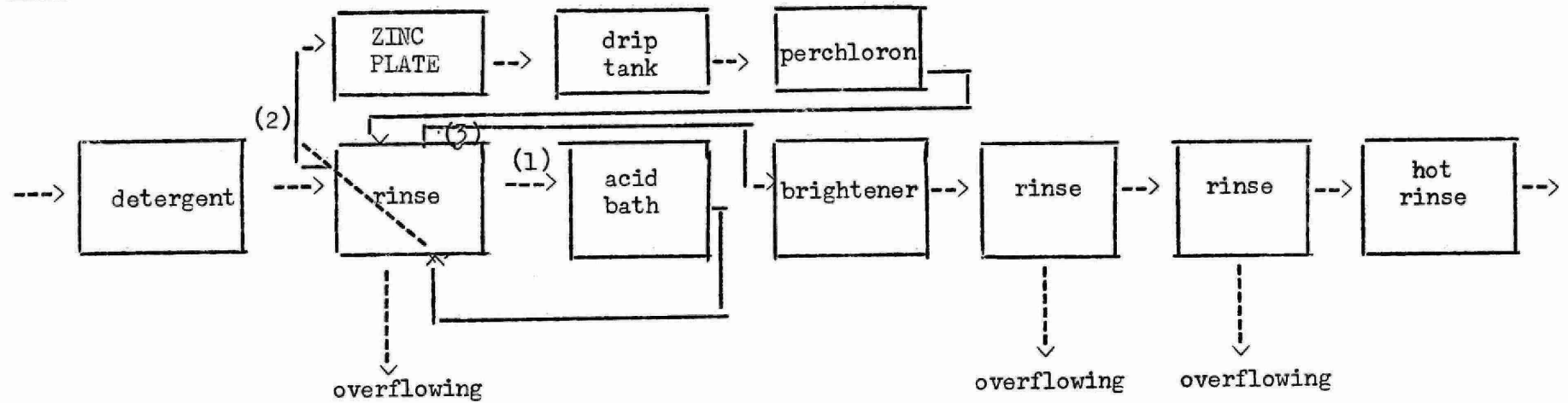
This company operates a vapour degreaser and zinc and nickel plating lines. Degreaser coolant is recirculated through rinses in the plating line.

The zinc and nickel plating lines are outlined in the following diagram:

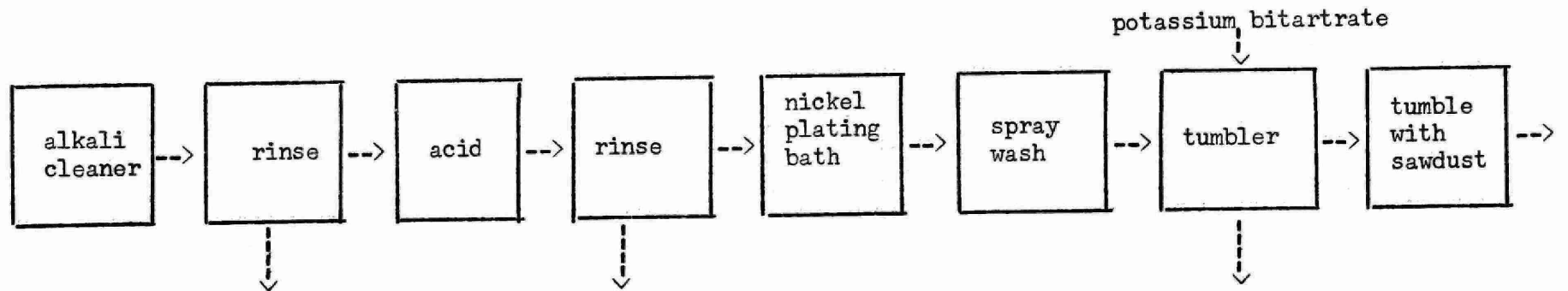
TURNER AND SEYMOUR CANADA LIMITED

PLATING LINE SCHEMATIC

ZINC



NICKEL



### Water Consumption and Distribution

PUC (1967):

Maximum ~ 3,500 gallons per day

Distribution:

Domestic - 400 " " "

Process - 3,100 " " "

### Sources of Liquid Wastes and Disposal

The major sources of waste in this plant are the various overflowing baths in the plating department. All process wastes flow by gravity to a ditch which discharges to Sinister Creek.

Sanitary wastes discharge to the municipal sewerage system.

### Sampling and Analysis

A grab sample was obtained from the first rinse after perchloron treatment in the zinc plate line on January 26, 1968. This sample was submitted to the OWRC laboratory for analysis in accordance with procedures outlined in "Standard Methods for the Examination of Water and Wastewater", 12th edition.

### CONCLUSIONS AND RECOMMENDATIONS

Analytical results of grab sample T-118 indicate that the perchloron treatment system was adequately destroying cyanide drag-out. Mr. Graham indicated that a new low cyanide zinc plating system would be installed by April, 1968, which would reduce the amount of cyanide destruction required.

Sample T-118 also indicates that the combined effluent to Sinister Creek complies with OWRC objectives for storm sewer discharge in terms of cyanide, zinc and suspended solids concentration.

The total plant effluent to Sinister Creek will be sampled when the low cyanide zinc plating solution is in use.

TURNER AND SEYMOUR CANADA LIMITED

Date Sampled: January 26, 1968

All analyses except pH reported in  
p.p.m. unless otherwise indicated

Lab. No.	5-Day B.C.D.	Solids			Cyanide as HCN	Zinc as Zn	pH at Lab.
		Total	Susp.	Diss.			
T-118		370	8	362	0.07	0.6	7.4
T-118      1.      1st bath after perchloron - grab at 8:30							

UNION CARBIDE CANADA LIMITED - VISKING DIVISION

An industrial wastes survey was conducted at the Union Carbide Canada Limited plant in Lindsay in early 1968.

Prior to this survey the company had periodic problems with boiling in the Graver section of the treatment system and this resulted in an unacceptable waste being discharged to Sinister Creek. In order to minimize the boiling problem, the company proposed the diversion of uncontaminated waste streams around the Graver unit.

The purpose of this survey was to characterise the quality of the flows to be by-passed and to assess the overall industrial waste treatment situation.

SUMMARY

The quality of the wastes discharged from Union Carbide to Sinister Creek exceeds OWRC objectives in terms of biochemical oxygen demand ( $BOD_5$ ), suspended solids and sulphate concentrations and pH range.

In order to reduce the quantity of pollution entering Sinister Creek, it is recommended that the company:

- 1) reduce the hydraulic load on the Graver,
- 2) attempt to control the Graver pH within  
a narrower range and determine an optimum  
pH for the addition of chemicals,

- 3) reconsider the use of ferric sulphate  
as a coagulant,
- 4) investigate the effects of the bleeding  
of caustic soak wastes and spent sulphuric  
acid on the Graver.

The flows to be by-passed should not require treatment in the Graver. With adequate pH adjustment, these wastes should be acceptable for discharge to a watercourse. It is imperative that adequate pH adjustment facilities be installed to neutralize this by-pass flow on a continuous basis.

#### DETAILS OF SURVEY

The survey was conducted on January 24, 25 and 26, 1968. Mr. Pfaff, General Engineering Supervisor, was interviewed concerning the operation of the plant and he indicated that the plant was operating normally.

#### Personnel Interviewed -

Mr. T. Fisher, Manager, Engineering Department	-	Union Carbide Canada Limited
Mr. J. Pfaff, General Engineering Supervisor	-	" " "

#### Personnel Participating -

Mr. L. Fitz	-	OWRC
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#### Description of Plant and Process

The process description is divided into preparation and processing.

### 1. Preparation

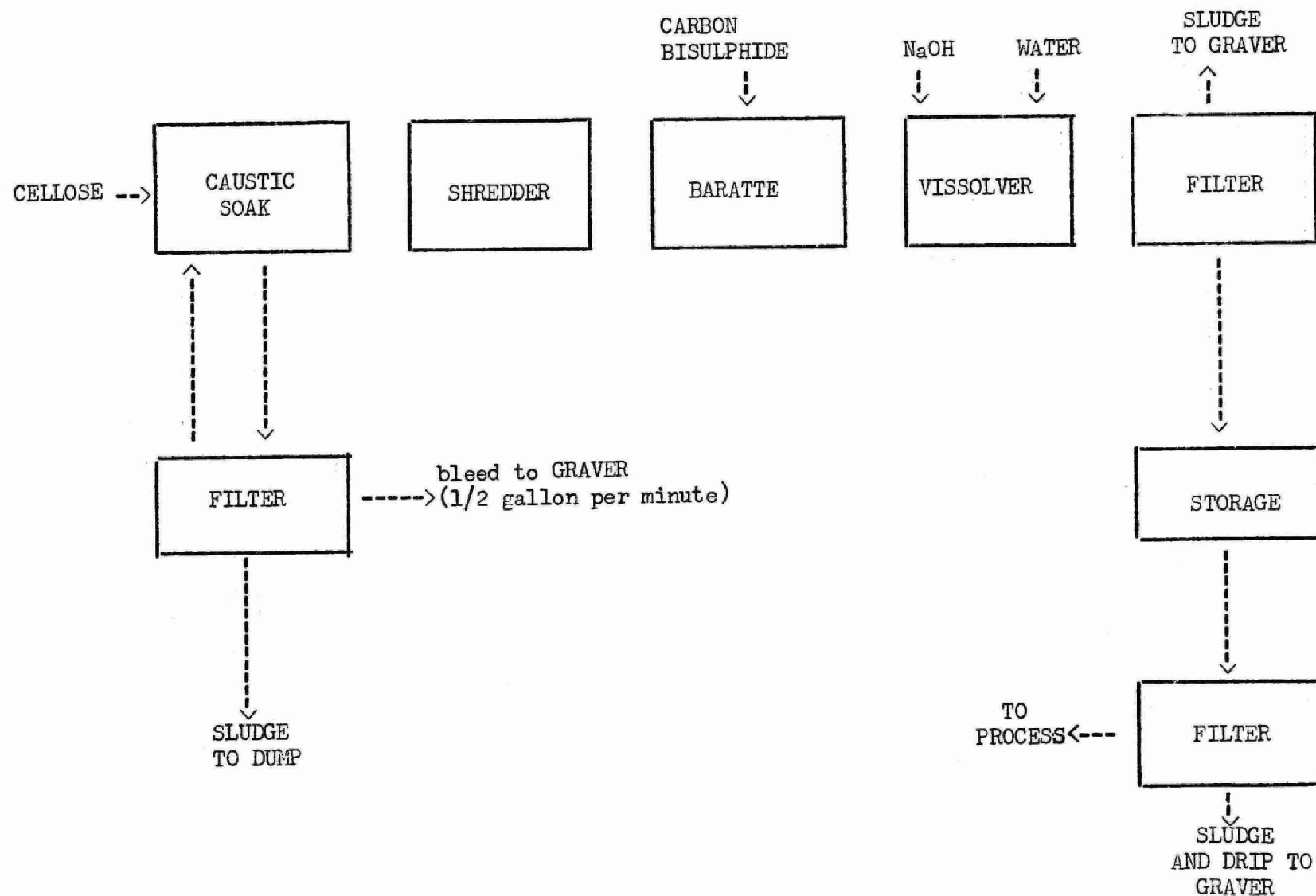
The cellulose fibre is soaked in caustic, squeezed dry and shredded. The shredded viscose is reacted with carbon bisulphide in a baratte to yield a zanthate, which is in turn dissolved into solution or to colloidal state in a vissolver. The syrupy solution is withdrawn from the vissolver and held in storage until it is required for filtering and processing.

### 2. Processing

The zanthate is extruded in acid, breaking the complex and yielding a cellulose tube which is dipped into an acid bath, then an overflowing water chill bath, two more acid baths and six counter-current overflowing water baths. The casing is then dipped in a glycerine bath, dried in an air tunnel and packaged. Six processing lines are operated in parallel.

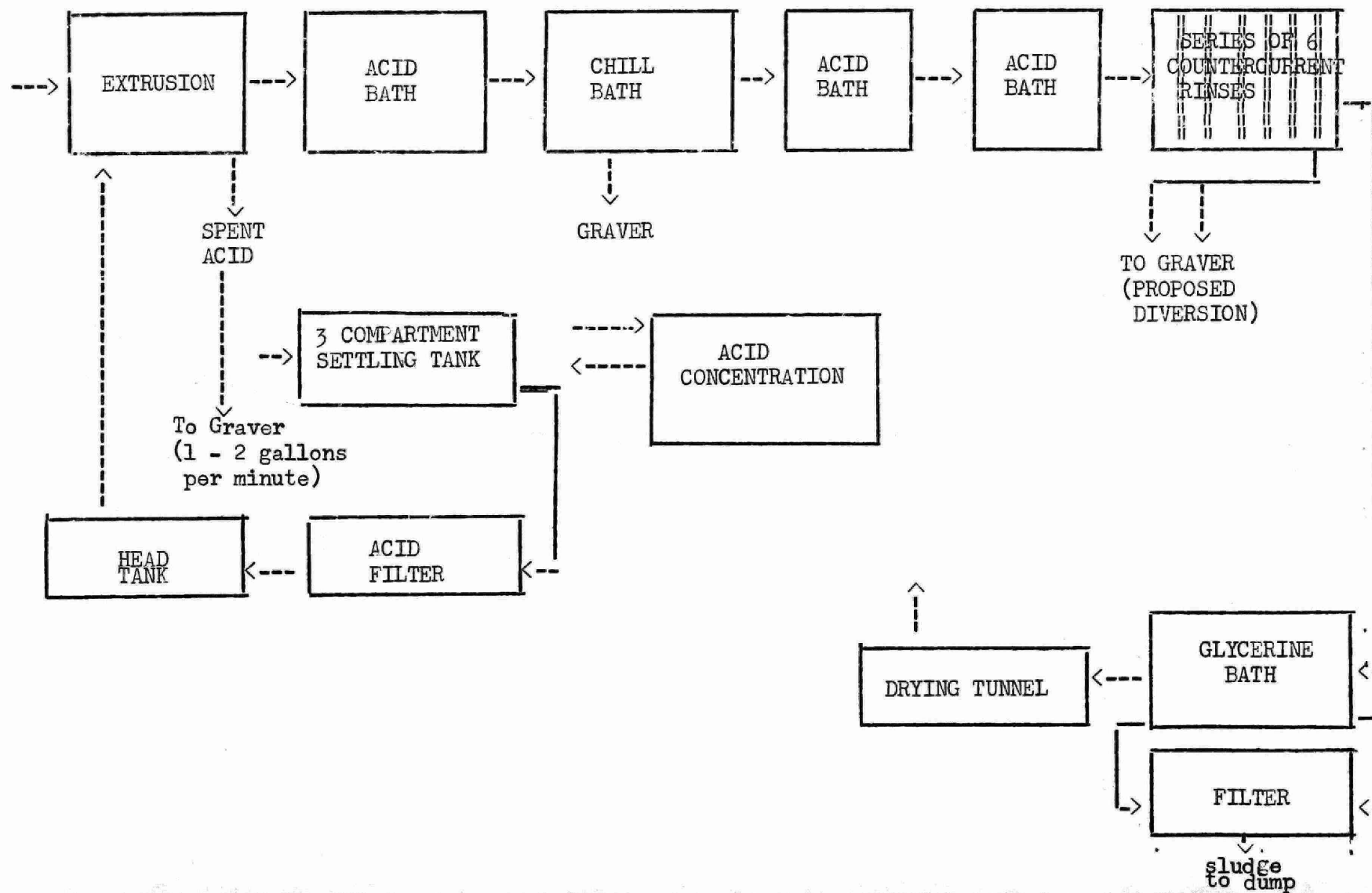
UNION CARBIDE CANADA LIMITED - LINDSAY

FEED PREPARATION SCHEMATIC



UNION CARBIDE CANADA LIMITED - LINDSAY

PROCESS SCHEMATIC



Production and Operating Data - 24 hours per day  
- 7 days per week

Employees - 450

Seasonal variation - none

Water Consumpt. on and Distribution

1967 Consumption

Maximum - 441 gallons per minute

Minimum - 265 " " "

Average - 326 " " "

Distribution

Domestic - 5 gallons per minute

Process - 321 " " "

Sources of Liquid Wastes and Disposal

1. Sanitary Sewer

Domestic - 6 gallons per minute

Miscellaneous in plant - 10 " " "

Boiler blowdown - 1 " " "

Barometric condensor - 23 " " "

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39 " " "

2. Storm Sewer

Caustic cooling - 20 gallons per minute

Water softening backwash - 8 " " "

Compressor coolant - 10 " " "

Vacuum pump - 5 " " "

Refrigeration (summer) - 45 " " "

Plastic extruder coolant - 5 " " "

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93 " " "

3. Graver

Miscellaneous hard	-	40	gallons per minute
Miscellaneous soft	-	30	" " "
Caustic bleed	-	1	" " "
Acid backwash	-	4	" " "
Acid bleed	-	1 - 2	" " "
Extruder	-	194	" " "
		270	" " "

4. Total - 402 gallons per minute.

Note: The 1967 water consumption figures did not include 73 gallons per minute used in the new extruder (this usage is included under "Sources of Waste and Disposal"). Therefore, estimated average 1968 water consumption is 399 gallons per minute, (based on 1967 water consumption figures). Average water consumption for January, 1968, was 380 gallons per minute.

Description of Plant (Treatment)

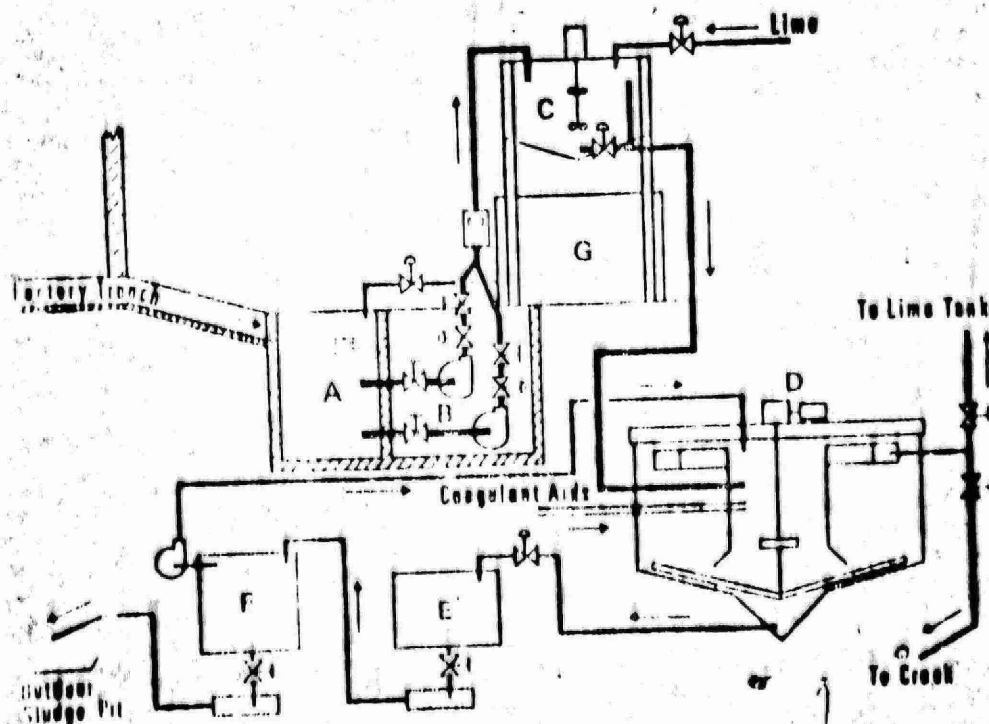
Waste from the plant to be treated in the Graver flows by gravity to sump A. Liquid from this sump is pumped by one of two pumps (B) into holding tank C which holds and agitates the liquid for approximately 15 minutes at design flow (200 gallons per minute). A pH controller actuates a feeder that pumps a lime slurry into C. The combination of lime and aeration is effective in eliminating any sulphurous odours.

The holding tank drains by gravity to the clarifier D. Sludge formed in the clarifier is blown-off into the collecting tank E and pumped into decanting tank F. Here the sludge is allowed to settle, leaving a clear supernatant which is pumped back to the clarifier. The sludge is pumped to one of two external pits for drying.

The supernatant from the Graver combines with the flow in the plant storm sewer and discharges to Sinister Creek.

UNION CARBIDE CANADA LIMITED  
WICKING DIVISION - LINDSAY  
TREATMENT PLANT SCHEMATIC

- A. Sump
- B. Lift Pumps
- C. Holding Tank
- D. Clarifier (Graver)
- E. Flow-off Tank
- F. Decanting Tank



Sampling and Analysis

Samples were obtained from within the plant and of the final effluent to Sinister Creek. All samples were submitted to the OWRC laboratory for analysis of solids, BOD<sub>5</sub>, COD, pH, ether solubles, sulphides and sulphates in accordance with procedures outlined in "Standard Methods for the Examination of Water and Wastewater", 12th edition.

SUMMARY OF DATA

DISCHARGE TO SINISTER CREEK

	SUSPENDED SOLIDS (ppm)	BOD <sub>5</sub> (ppm)	pH	ETHER SOLUBLES (ppm)	SULPHATE (ppm)	SULPHIDE (ppm)	COD (ppm)
November, 1966	42	6.0	8.1	-	4893	0.0	44
March, 1966	1	28	8.8	-	2722	-	53
April, 1966	15	2.8	7.9	-	3541	2.5	184
August, 1966	10	18	8.6	-	2573	0.0	-
January, 1967	12	12	8.5	-	-	-	600
October 5, 1967 <sup>(1)</sup>	126	40	7.9	-	2240	2.0	146
October 6, 1967 <sup>(1)</sup>	128	64	7.4	-	2340	5.0	204
January 24, 1968	90	37	8.9	2.0	3660	-	193
January 25, 1968	119	54	9.9	2.0	3000	0.1	58
January 26, 1968	67	54	9.0	5.0	3800	0.0	676
	(1) Gravel upset						

The following observations are based on data presented in the previous table:

1. Generally, the hydrogen sulphide concentration in the effluent to Sinister Creek varies inversely with the pH level and is zero if the pH is greater than 8.5.

2. The pH of the final effluent to Sinister Creek varies randomly from 7.4 to 10.0 indicating insufficient control of the pH level.

3. The quality of the discharge from the Graver has deteriorated since the new extruder has been installed.

#### WASTE LOADINGS

Waste loadings to Sinister Creek are summarized in the following table:

<u>Characteristic</u>	<u>Concentration<sup>(1)</sup> (ppm)</u>	<u>Loading<sup>(2)</sup> (lb/day)</u>
Suspended Solids	92	504
BOD <sub>5</sub>	48	262
Ether solubles	3	16.4
Sulphates	3486	19,100
Sulphides	nil	nil

(1) Concentration calculated as average of samples T-105, T-106 and T-110.

(2) Based on daily average flow of 547,000 gallons.

The treatment plant efficiency based on samples T-107 and T-109 is summarized as follows:

Contaminant	Influent Concentration (ppm)	Effluent Concentration (ppm)	% Reduction
Suspended Solids	40	107	-167
BOD <sub>5</sub>	172	64	63
Sulphates	8300	4900	41
Sulphides	10	0	100

#### DISCUSSION OF FINDINGS

The following table compares the average quality of the final effluent to Sinister Creek with the OWRC objectives:

	<u>BOD<sub>5</sub> (ppm)</u>	<u>Sulphate (ppm)</u>	<u>Suspended Solids (ppm)</u>	<u>pH</u>	<u>Ether Solubles (ppm)</u>
Effluent	48	3486	92	(8.9, 9.0, 9.9)	3
OWRC Objective	15	1500	15	(5.5 - 9.5)	15

On January 24, 25 and 26, 1968, the final effluent exceeded OWRC objectives in terms of BOD<sub>5</sub>, suspended solids and sulphate concentration. On January 25, 1968, the pH exceeded the OWRC maximum objective of 9.5.

During the inspection, the Graver did not appear to be upset or boiling. Therefore, the decrease in effluent quality appears to be a direct result of decreased hydraulic retention time in the treatment system. The effluent in January, 1968, was of comparable

quality to the effluent in October, 1967, when boiling problems existed and of poorer quality than on previous sampling dates when boiling was not experienced. It is therefore recommended that the company take steps to reduce the hydraulic load on the Graver and thus increase its removal efficiency.

It is noted that the pH of the Graver varies randomly from about 7.5 to 10. This variation will affect the quality of the floc forming the sludge blanket and probably arises as a result of inadequate equalization and inadequate control on the lime feed system. Electrolytes and chemical coagulants react readily to changes in the pH of the waste water. Alum which has a pH range of maximum insolubility between 5 and 7, is soluble to the extent of 10 ppm at pH 9 and 100 ppm at pH 10. With a high pH in the Graver, it is possible to have alum in the effluent in a dissolved state which would subsequently precipitate out with a lowering of the pH. It is therefore recommended that the company attempt to control the pH within a narrower range and determine an optimum pH for the chemicals added. Further consideration should also be given to previous data accumulated by Mr. Macey (OWRC Report - July, 1964) on the use of ferric sulphate as a coagulant.

The bleeding of the caustic soak wastes (1/2 gallon per minute) and the spent acid (1 - 2 gallons per minute) probably contribute a major portion of the BOD<sub>5</sub>, sulphides and sulphates in the Graver feed. These wastes may be adequately treated in the

Graver once the proposed by-pass is operational, however, the next step, if problems are encountered, may be to divert these wastes from the Graver and to treat them in an alternative manner.

The quality of the flows to be by-passed around the Graver is represented by samples T-111 and T-112. Analysis of these samples indicate that these wastes do not require treatment in the Graver. It is imperative, however, that pH adjustment facilities be installed to control the pH level of this flow on a continuous basis.

#### CONCLUSIONS AND RECOMMENDATIONS

The quality of the effluent discharged from Union Carbide to Sinister Creek exceeds OWRC objectives in terms of BOD<sub>5</sub>, suspended solids and sulphate concentrations and pH level. An increased hydraulic load appears to be a major factor in this deterioration of quality.

It is recommended that the company control the pH of the Graver within a narrower range and determine an optimum pH at which the chemicals should be added. The company should consider the data previously provided by the OWRC on the use of ferric sulphate as a coagulant.

The flows to be by-passed appear to be acceptable for discharge to the creek, providing that continuous pH adjustment facilities are installed.

UNION CARBIDE CANADA LIMITED - VISKING DIVISION

Date Sampled: January 24, 1968

All analyses except pH reported in  
p.p.m. unless otherwise indicated

Lab. No.	5-Day B.O.D.				pH at Lab.	Ether Solubles	Sulphate as SO <sub>4</sub>	Sulphide as H <sub>2</sub> S	COD
		Total	Susp.	Diss.					
T-105	37.	6076	90	5986	8.9	2	3660	0.0	193
T-106	54.	6014	67	5947	9.0	5	3800	0.0	676
T-107	172.	10928	40	10888	2.2	4	8300	10.0	444
T-108	118.	10718	2120	8598	8.9	14	5700	0.0	175
T-109	64.	8818	107	8711	9.1	2	4900	0.0	78
T-110	54.	5204	119	5085	9.9	2	3000	0.1	58
T-111	10.	1202	4	1198	3.4	0	680	0.0	78
T-112	14.	10522	4	10518	1.8	1	7400	0.5	58
T-105	1.	Storm discharge to Sinister Creek				Grab 3:00 p.m. January 24, 1968			
T-106	2.	"	"	"	"	Grab 8:40 a.m. January 26, 1968			
T-107	3.	Sump before holding tank				Grab 10:30 January 24, 1968			
T-108	4.	Holding tank effluent				Grab 10:30 a.m. January 24, 1968			
T-109	5.	Effluent from Graver				Grab 10:30 a.m. January 24, 1968			
T-110	6.	Effluent to Sinister Creek				Grab 2:50 p.m. January 24, 1968			
T-111	7.	2nd water tub				Grab 10:15 a.m. January 24, 1968			
T-112	8.	1st water bath				Grab 10:00 a.m. January 24, 1968			

UNIROYAL 1966 LIMITED

Uniroyal 1966 Limited was inspected on January 25, 1967.

DETAILS OF SURVEY

Personnel Interviewed - Mr. D. A. Moir, Factory Manager.

Operating Schedule - 24 hours per day.  
- 5 days per week.

Number of Employees - 150.

Products - sheet tire cord, high pile fabric.

Raw Materials - nylon filament, orlon, viscose, polyester staple fibre.

Description of Plant and Process

Plant 1

Nylon filaments are twisted and woven into a sheet. The sheet is then stretched in a system of rollers employing a liquid stretching aid. Excess aid is withdrawn in a vacuum system employing a water curtain scrubber.

Plant 2

This plant uses various dyed fibres as raw materials. The various fibres are corded, knitted and finished (buffed, etc.) to form a high pile fabric. These processes are all dry. Mr. Moir indicated that a dye operation may be installed at this plant in the future for the raw fibres.

Water Consumption (1967) and Distribution

Consumption:

Maximum	-	1,528,000	gallons per month
Minimum	-	614,000	" " "
Average	-	1,068,000	" " "

Distribution:

Water curtain scrubber	-	530,000	gallons per month
Humidification	-	400,000	" " "
Latex backing and wash-up	-	50,000	" " "
Cooling pond make-up	-	22,000	" " "
Domestic	-	66,000	" " "
TOTAL	-	1,068,000	gallons per month

Sources of Liquid Wastes and Disposal

The main sources of liquid wastes are:

- scrubber water curtain
- domestic
- softener backwash
- floor drains

Disposal

All cooling water used in these plants is recirculated through a cooling pond with a bleed off to a storm ditch. Latex backing and wash-up wastes are discharged to the municipal sanitary

sewerage system. The effluent from the water curtain scrubber is clarified in a settling pond prior to discharge to the sanitary sewer system.

Domestic wastes are discharged directly to the sanitary sewer system.

#### SAMPLING AND ANALYSIS

No samples were obtained from the waste discharges from these plants.

#### CONCLUSIONS AND RECOMMENDATIONS

Wastes from these plants should not adversely affect the municipal sewerage system. Careless operation with a subsequent loss of latex to the sewage collection system could result in deposition in the sewer and accelerated wear on pumps.



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